COURSE

Name : Optimal Operation of Power System
Code  : EE185111
Credit(s) : 3
Semester : I

Description of Course

The course of optimal operation of the power system discusses the topic of scheduling and economic optimal of power plant loading. Optimal plant loading is carried out by considering the limitations of primary energy supply and network constraints such as voltage and channel capacity. In addition, this course also discusses the coordination between thermal power plants (thermal) and hydropower (Hydro) in supplying loads. Some conventional methods and intelligent methods are introduced to solve problems.

Learning Outcomes

Knowledge
(P02) Mastering engineering concepts and principles to develop the necessary procedures and strategies for systems analysis and design in the areas of power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics.

Specific Skill
(KK01) Being able to formulate engineering problems with new ideas for the development of technology in power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics.

General Skill
(KU02) Being able to perform academic validation or studies in accordance with their areas of expertise in solving problems in relevant communities or industries through the development of knowledge and expertise.

Attitude
(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.
(S12) Working together to be able to make the most of his/her potential.

Course Learning Outcomes

Knowledge
Mastering the concept of scheduling the generator plant and operation of the electric power system optimally by considering the limitations of primary energy supply and the limitations of the transmission network.

Mastering the concept of coordinating thermal and hydro plants.

Specific Skill
Being able to formulate mathematically the problem of operating an electric power system which includes optimal scheduling of the power plant and operation of the power system by considering the limitations of primary energy supply and limitation of the transmission network as well as coordinating thermal and hydro power plants.
General Skill
Being able to use Matlab / Powergen / Powerworld software to solve the problem of scheduling the generation and operation of the electric power system optimally by considering the limitations of primary energy supply and the limitation of the transmission network as well as coordinating thermal and hydro power plants.

Attitude
Demonstrate an attitude of being responsible for work in his area of expertise independently.
Able to work together in teams and be responsible for team achievements.

Main Subjects
1. Economic Dispatch
2. Commitment Unit
3. Take or Pay contract scheme
4. Composite generation cost function
5. Scheduling primary fuel
6. Coordination of Hydro-thermal plants
7. Optimal power flow
8. Security constrained optimal power flow

Reference(s)
[1] Power Generation Operation and Control (Allen J. Wood & Bruce F. Wollenberg), 2014
[2] Power System Analysis (Hadi Saadat)

Prerequisite(s)
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